

Trend Study 17-28-97

Study site name: Spring Hollow.

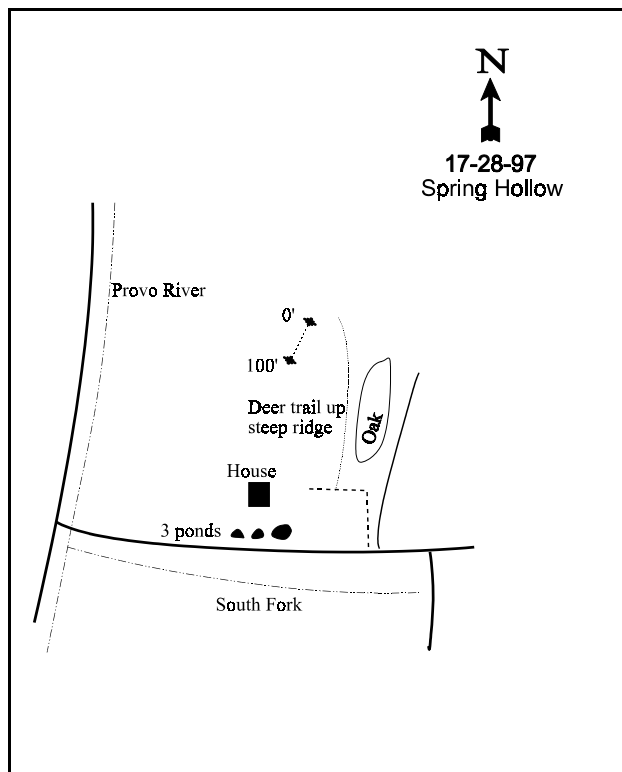
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 205 degrees magnetic.

Frequency belt placement: line 1 (11, 34, 59, 71 & 95ft).

LOCATION DESCRIPTION

Beginning in Provo Canyon, proceed 3.1 miles up the south fork of the Provo River to an old road just past a house with 3 ponds in front of it. From the paved road, walk 40 paces up the old (closed) road to a fence corner. Walk west along the fence line to a deer trail. Hike northerly up the trail about 250 yards to an oak saddle. The study runs south down the ridge from the oak saddle. The 0-foot baseline stake is 20 paces from the saddle. Browse tag #3986 is attached to the 0-foot baseline stake. Hint: the oak saddle is at an azimuth of 350 degrees from the fence corner.



Map Name: Bridal Veil Falls

Diagrammatic Sketch

Township 5S, Range 4E, Section 32

GPS: NAD 27, UTM 12S 4465360 N 455373 E

DISCUSSION

Spring Hollow - Trend Study No. 17-28

***SUSPENDED - This site was suspended in 2002.

The Spring Hollow study is located on the South Fork of the Provo River. The study is at approximately 5,800 feet elevation and near the top of a small north-south oriented ridge. The slope is steep at 75% with an aspect to the west and southwest. The sampled range type is a small area of mixed mountain brush that may be limited by the extremely shallow, rocky soil and very steep slope. In 1983, it was reported that the frequency of pellet groups and the intensity of browse utilization was high. This does not appear to be the situation at this time. While some browse species exhibit moderate hedging, pellet group frequency is very low. It is recommended that this site no longer be sampled in the future.

Soil is exceptionally shallow and rocky with exposed bedrock in many places. Soil textural analysis indicates a clay loam soil with a neutral pH of 6.3. The effective rooting depth (see methods) is quite shallow measuring almost 8 inches. The soil surface is mostly covered with rock and pavement. Gullies are found on either side (east and west) of the site. Presently, erosion does not appear to be higher than expected on this steep and rocky slope.

Browse composition is mixed and seemingly dependent on slope position. Near the ridge top, true mountain mahogany and mountain big sagebrush prevail. Further downslope, Gambel oak becomes increasingly common. All of these species are important forage sources. The initial reading (1983) of this site indicated 1,232 mountain big sagebrush plants/acre. The current estimate is 320 plants/acre. This is a mature population with no seedlings and only one young plant classified. All of the decadent plants encountered were classified as dying at this time. Height and crown measurements have increased to 26 inches and 39 inches respectively. The true mountain mahogany population is mostly mature with an average height of just over 4 feet. Utilization is moderate with most showing good vigor. The 1997 density estimation was 240 plants/acre. Broom snakeweed density has been highly variable with an estimated density of 840 plants/acre in 1997. In 1983, utilization of Gambel oak was moderate to heavy, but this is no longer the case. Gambel oak now exhibits light hedging with an estimated density of 1,740 stems/acre. White rubber rabbitbrush, stickyleaf low rabbitbrush, and antelope bitterbrush were other browse species encountered, but consist of only scattered individuals.

As reported in 1983, herbaceous plants are poorly represented in this community. Bluebunch wheatgrass is an important perennial grass that has significantly increased in nested frequency since 1989. Cheatgrass and Japanese brome are present but not very abundant at this time. Soil characteristics and severe erosion preclude development of any significant herbaceous understory. Apparently the only herbaceous plants that can flourish under these conditions are annuals or perennials that complete their growth cycle early, before the upper soil horizons dry completely.

1983 APPARENT TREND ASSESSMENT

Soil trend is declining because of the steep slope, lack of perennial cover, and excessive erosion. Vegetative trend is also down. The big sagebrush population, although reproductively dynamic, is slowly being browsed out of existence because of no recruitment of young plants. True mountain mahogany also is heavily browsed but is in slightly better condition. Oak will persist and perhaps even thicken, especially on the lower slopes. Herbaceous composition and density is poor and unlikely to improve.

1989 TREND ASSESSMENT

The soil trend is down due to the continual movement of rocks and the lack of developed soils. There is little sign of recent big game use. The important shrubs have increased in size since 1983 and show improved vigor. Overall, the vegetative trend is stable. Species composition is unchanged.

TREND ASSESSMENT

soil - down (1)

browse -stable (3)

herbaceous understory - stable (3)

1997 TREND ASSESSMENT

The soil trend is stable. There are no signs of accelerated erosion at this time. Vegetation cover is scattered and the surface is armored by rock and pavement. Browse trend is stable for true mountain mahogany and oak which make up 95% of the browse cover. The mountain big sagebrush population is slowly being lost. However, currently it only contributes to 1% of the browse cover. The percent decadency has remained nearly the same over all years. Now the number of dead plants outnumber living ones. Other browse have remained relatively stable with the exception of the highly fluctuating broom snakeweed population. The herbaceous trend is slightly downward. Mutton and Sandberg bluegrasses have decreased slightly in sum of nested frequency with bluebunch wheatgrass significantly increasing. Very few forbs are found on the site while *Lathyrus brachycalyx*, the predominant forb in past years, was not sampled in 1997.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - slightly downward (2)

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 28

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	
G	<i>Agropyron spicatum</i>	_a 72	_a 93	_b 126	31	42	50	7.83
G	<i>Bromus japonicus</i> (a)	-	-	47	-	-	18	1.07
G	<i>Bromus tectorum</i> (a)	-	-	97	-	-	33	1.31
G	<i>Poa fendleriana</i>	18	16	8	10	8	3	.30
G	<i>Poa secunda</i>	_b 22	_{ab} 12	_a 3	8	6	1	.03
Total for Annual Grasses		0	0	144	0	0	51	2.39
Total for Perennial Grasses		112	121	137	49	56	54	8.17
Total for Grasses		112	121	281	49	56	105	10.56
F	<i>Alyssum alyssoides</i> (a)	-	-	22	-	-	8	.04
F	<i>Allium</i> spp.	_b 62	_a -	_a -	29	-	-	-
F	<i>Castilleja chromosa</i>	2	-	-	1	-	-	-
F	<i>Cryptantha</i> spp.	3	-	-	1	-	-	-
F	<i>Cynoglossum officinale</i>	-	2	3	-	1	1	.03
F	<i>Eriogonum brevicaulle</i>	_b 30	_b 28	_a -	13	14	-	-
F	<i>Eriogonum</i> spp.	-	-	9	-	-	5	.33

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'83	'89	'97	'83	'89	'97	'97
F	Lathyrus brachycalyx	c80	b44	a-	33	15	-	-
F	Machaeranthera canescens	-	1	-	-	1	-	.00
F	Penstemon humilis	-	-	1	-	-	1	.00
F	Penstemon spp.	-	2	2	-	1	1	.03
F	Tragopogon dubius	2	-	-	1	-	-	-
Total for Annual Forbs		0	0	22	0	0	8	0.04
Total for Perennial Forbs		179	77	15	78	32	8	0.39
Total for Forbs		179	77	37	78	32	16	0.43

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 17 , Study no: 28

T y p e	Species	Strip Frequency	Average Cover %
		'97	'97
B	Artemisia tridentata vaseyana	12	.19
B	Cercocarpus montanus	10	2.84
B	Chrysothamnus nauseosus albicaulis	1	-
B	Chrysothamnus viscidiflorus viscidiflorus	2	.00
B	Gutierrezia sarothrae	21	.53
B	Quercus gambelii	27	-
Total for Browse		73	3.59

BASIC COVER --

Herd unit 17 , Study no: 28

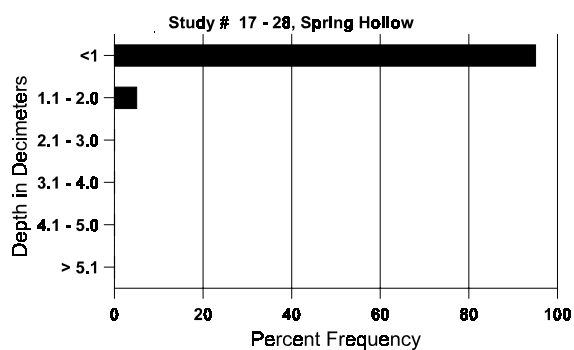
Cover Type	Nested Frequency	Average Cover %		
		'83	'89	'97
Vegetation	244	1.25	3.00	30.21
Rock	343	40.75	54.50	49.10
Pavement	159	8.75	13.00	5.99
Litter	330	37.50	24.00	23.80
Cryptogams	3	4.00	.25	.03
Bare Ground	91	7.75	5.25	3.95

SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 28, Spring Hollow

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
7.36	60.5 (10.0)	7.3	38.0	39.1	22.9	4.9	16.4	92.8	.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 17 , Study no: 28

Type	Quadrat Frequency	Pellet Transect	
		Pellet Groups per Acre	Days Use per Acre (ha)
	'97	07	07
Deer	2	35	3 (7)

BROWSE CHARACTERISTICS --

Herd unit 17 , Study no: 28

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133		4	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	11	-	-	-	-	-	-	-	-	11	-	-	-	366		11	
	89	5	-	-	-	-	-	-	-	-	5	-	-	-	166		5	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	83	-	-	11	-	-	-	-	-	-	-	-	4	7	366	5 8	11	
	89	9	7	-	-	-	-	-	-	-	16	-	-	-	533	13 10	16	
	97	5	2	1	2	-	-	-	-	-	10	-	-	-	200	26 54	10	
D	83	-	-	15	-	-	-	-	-	-	-	-	-	15	500		15	
	89	6	1	-	1	-	-	-	-	-	8	-	-	-	266		8	
	97	3	2	-	-	-	-	-	-	-	-	-	-	5	100		5	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	2380		119	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			70%			70%			-22%							
'89		28%			00%			00%			-67%							
'97		25%			06%			31%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	1232	Dec:	41%			
												'89	965		28%			
												'97	320		31%			
Cercocarpus montanus																		
S	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	6	-	-	-	-	-	-	-	-	6	-	-	-	200		6	
	89	3	2	2	-	-	-	-	-	-	6	-	1	-	233		7	
	97	1	1	-	-	-	-	-	-	-	-	1	1	-	40		2	
M	83	-	-	7	-	1	-	-	-	-	3	-	5	-	266	44 32	8	
	89	5	5	1	-	-	-	-	-	-	10	-	1	-	366	51 45	11	
	97	3	4	2	-	-	-	-	-	-	8	1	-	-	180	54 96	9	
D	83	-	-	1	-	-	-	-	-	-	-	-	-	1	33		1	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		07%			53%			40%			+17%							
'89		39%			17%			11%			-60%							
'97		50%			17%			08%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	499	Dec:	7%			
												'89	599		0%			
												'97	240		8%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.			Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		1	2	3	
Chrysothamnus nauseosus albicaulis																			
M	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33	28	47	1	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	25	24	1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	31	31	0	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	1	-	-	-	-	-	-	-	-	-	-	-	1	33			1	
	97	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'83		00%			00%			00%			+50%								
'89		00%			00%			50%			-70%								
'97		00%			00%			100%											
Total Plants/Acre (excluding Dead & Seedlings)												'83	33	Dec:	0%				
												'89	66		50%				
												'97	20		100%				
Chrysothamnus viscidiflorus viscidiflorus																			
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40	11	9	2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'83		00%			00%			00%											
'89		00%			00%			00%											
'97		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-				
												'89	0		-				
												'97	40		-				
Gutierrezia sarothrae																			
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1	
	97	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10	
M	83	7	-	-	-	-	-	-	-	-	7	-	-	-	233	13	10	7	
	89	46	-	-	-	-	-	-	-	-	36	-	10	-	1533	9	9	46	
	97	32	-	-	-	-	-	-	-	-	32	-	-	-	640	15	17	32	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>								
'83		00%			00%			00%			+85%								
'89		00%			00%			21%			-46%								
'97		00%			00%			00%											
Total Plants/Acre (excluding Dead & Seedlings)												'83	233	Dec:	-				
												'89	1566		-				
												'97	840		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
M	83	-	-	-	-	-	1	-	-	-	1	-	-	-	33	28	75	1
	89	-	-	1	-	-	-	-	-	-	1	-	-	-	33	39	69	1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			100%			00%			+ 0%							
'89		00%			100%			00%										
'97		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	33	Dec:	-			
												'89	33		-			
												'97	0		-			
Quercus gambelii																		
S	83	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	89	4	-	-	4	-	-	7	-	-	14	-	1	-	500			15
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	83	-	20	20	-	-	-	-	-	-	40	-	-	-	1333			40
	89	76	-	-	-	-	-	-	-	-	74	-	2	-	2533			76
	97	35	-	-	5	-	-	-	-	-	40	-	-	-	800			40
M	83	-	51	-	-	-	-	-	-	1	42	10	-	-	1733	22	13	52
	89	24	-	-	-	-	-	-	-	-	21	-	3	-	800	37	30	24
	97	28	-	-	8	-	-	3	3	-	42	-	-	-	840	49	60	42
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	5	1	-	-	-	-	-	-	-	2	-	4	-	200			6
	97	3	-	-	2	-	-	-	-	-	2	1	-	2	100			5
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		77%			23%			00%			+13%							
'89		.94%			00%			08%			-51%							
'97		00%			00%			02%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	3066	Dec:	0%			
												'89	3533		6%			
												'97	1740		6%			